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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/012,195	12/05/2001	Lawrence G. Clawson	3402.1007-000	5684
21005	7590	02/16/2006	EXAMINER	
HAMILTON, BROOK, SMITH & REYNOLDS, P.C.			HANDAL, KAITY V	
530 VIRGINIA ROAD			ART UNIT	
P.O. BOX 9133			PAPER NUMBER	
CONCORD, MA 01742-9133			1764	

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/012,195

Applicant(s)

CLAWSON ET AL.

Examiner

Kaity Handal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 July 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) 4,6,9,11-15,20-24, 26-29,30-36,38,41,42-48 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5,7,8,10,16-19,25-29,37,39,40,49 and 50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>10/20/03,10/14/03</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group II, Species a-2 (claims 1-3, 5, 7-8, 10, 16-19, 25, 27-29, 37, 39, 40, 42-50) in the reply filed on 7/11/2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. The examiner further withdraws claims 42-48 from further consideration as they do not read on the elected species. "End caps" are not described under Figure 4 in the Specification.
3. The examiner further withdraws claims 27-29 from further consideration as they depend a non-elected claim (claim 26).

Specification

4. The disclosure is objected to because of the following informalities: reference number (215) is used for "coiled tubes" on page 14, line 22; and used for "one expansion bellows" on page15, line 17.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 8, it is unclear if oxygen containing gas is preheated in a zone which is different from second zone as claimed in claim 1. For examining purposes, the limitation "a zone", of claim 8, is treated as the "second zone" recited in claim 1.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3, 5, 7-8, 10, 16-19, 25, 37, 39-40, 49 and 50 are rejected under 35 U.S.C. 102(b) as being anticipated by Dantowitz (US 3,541,729).

With respect to claims 1 and 7, Dantowitz teaches a reactor/reformer (fig. 1, 1) comprising: a core reaction zone/cylindrical inner wall (45) being configured to conduct exothermic reactions including combustion/partial oxidation/(in burner) (3)), and reforming/(in catalyst bed (31)); shells/walls (13, 47, 71, 85) each having a shell wall (illustrated), the shells/walls (13, 47, 71, 85) being arranged coaxially about the core reaction zone/cylindrical inner wall (45) (illustrated); a gap (illustrated) being defined between each of the shells' walls to form a plurality of coaxial zones

(illustrated), the reactor/reformer (1) being configured to permit heat transfer directly from one zone to another (illustrated); and the reactor/reformer (1) being configured so that hydrocarbon feed stock/reformable fuel (129) is preheated by traversing a first zone/zone extending between reactant inlet passage (111) and catalyst bed (31) (as illustrated), and an oxygen containing gas/air is preheated/burnt by traversing a second zone/burner (3) (col. 2, lines 47-51).

With respect to claim 2, Dantowitz teaches wherein said reactor/reformer (1) is further configured so that water/steam is preheated in a third zone/boiler reservoir (123).

With respect to claim 3, Dantowitz teaches wherein said reactor/reformer (1) is configured so that water/steam (125) is preheated along with the feedstock/reformable fuel (129) in the first zone/zone extending between reactant inlet passage (111) and catalyst bed (31) (as illustrated).

With respect to claim 5, Dantowitz teaches wherein a burner (3) supplies heat to a steam reforming reaction/catalyst bed (31) in the core reaction zone/burner (3).

With respect to claim 8, Dantowitz teaches wherein said reactor/reformer (1) is configured so that so that oxygen containing gas/air supporting burner combustion is preheated in a zone/second zone/burner (3) (col. 2, lines 47-51).

With respect to claim 10, Dantowitz teaches wherein said reactor/reformer (1) is configured so that exhaust/hot fluid (127) from the burner (3) is flowed through a zone/catalyst heating segment (117) for heat exchange with one or more other zones/catalyst bed (31).

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With respect to claim 16, Dantowitz teaches wherein said reactor/reformer (1) is configured so that said zones have gaps (illustrated).

With respect to claim 19, Dantowitz teaches wherein a steam reformer/reforming catalyst bed (31) (col. 4, lines 48-51) is in the core reaction zone/cylindrical inner wall (45) (illustrated).

With respect to claim 25, Dantowitz teaches a reactor/reformer (1) comprising: shells having walls (13, 47, 71, 85) arranged coaxially (as illustrated) about each other; a gap being defined between each of the successive shells forming a plurality of coaxial zones (illustrated), the shells being configured to permit heat transfer directly from one zone to another; wherein a first zone/cylindrical inner wall (45) is configured to conduct steam reforming (in catalyst bed (31)) (col. 4, lines 48-51) and at least one of the exothermic reactions combustion/partial oxidation/in burner (3); and the reactor/reformer (1) being configured so that hydrocarbon feed stock/reformable fuel (129) is preheated in a second zone/zone extending between reactant inlet passage (111) and catalyst bed (31) (as illustrated), and an oxygen containing gas/air is preheated/burnt in a third zone/burner (3) (col. 2, lines 47-51).

With respect to claim 37, Dantowitz teaches a reactor/reformer (1) comprising: a plurality of nested shells/walls (13, 47, 71, 85) each having an annular wall and having a gap between each adjacent wall defining a zone (illustrated); said reactor/reformer (1) being configured such that each zone contains a different heat transfer medium/reformate (131) flows within reformate confining wall (85) & water (121) flows through boiler reservoir (123) outer wall (71) & hot fluid (127) flows

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outside cylindrical inner wall (45); and wherein the heat transfer mediums (131, 121, 127) travel through the zones and exchange heat through shell walls (illustrated).

With respect to claim 39, Dantowitz teaches a reactor/reformer (1) comprising a plurality of at least five nested shells/walls (13, 9, 47, 71, 85).

With respect to claim 40, Dantowitz teaches a reactor/reformer (1) comprising:

- a plurality of nested shells/walls (13, 9, 47, 71, 85) having a gap defined between each of the successive shells to form a plurality of coaxial zones between adjacent shells (illustrated);
- a stream of heated material/hot fluid (127) produced by an exothermic reaction including combustion/partial oxidation/burning in burner (3);
- a second stream of heated material/reformate (131) produced by an exothermic reaction/shift reaction (col. 6, lines 73-75 and col. 7, line 1);
- and wherein the streams of heated materials (127 & 131) are each routed as follows: heated material/hot fluid (127) is routed through zone adjacent to zone/frusto-conical baffle wall (17) containing hydrocarbon feedstock/reformable fuel (129); and heated material/ reformate (131) is routed through zone adjacent to zone/boiler reservoir (123) containing steam/water (121).

With respect to claim 49, Dantowitz teaches a reactor/reformer (1) comprising: a plurality of nested shells/walls (13, 9, 47, 71, 85) having walls arranged coaxially and defining a gap between each of the successive shells forming a plurality of coaxial zones (as illustrated), the shells being configured to permit heat transfer from one

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zone to another (as illustrated); and wherein a first zone/cylindrical inner wall (45) contains a catalyst/reforming catalyst bed (31) (col. 4, lines 48-51) and a shift catalyst (col. 6, lines 73-75 and col. 7, line 1); and the reactor being configured so that a hydrocarbon feed stock/reformable fuel (129) is preheated in a second zone/zone extending between reactant inlet passage (111) and catalyst bed (31) (as illustrated), and an oxygen containing gas/air is preheated/burnt by traversing a second zone/burner (3) (col. 2, lines 47-51); and an oxygen containing gas/air is preheated in a third zone/burner (3).

With respect to claim 50, Dantowitz teaches a reactor/reformer (1) comprising: a core reaction zone/shell (9) having an outer wall/cylindrical inner wall (45), the core reaction zone/shell (9) configured to conduct at least one exothermic reaction/shift reaction (col. 6, lines 73-75 and col. 7, line 1) and at least one fuel reforming reaction/in catalyst bed (31) (col. 4, lines 48-51);

at least three shells/walls (47, 71, 85) arranged concentrically about the outer wall of the core reaction zone, a gap being defined between the outer wall of the core reaction zone and each of the successive shells to form a plurality of coaxial zones (illustrated), the shells being configured to permit heat transfer directly between each adjacent zone (illustrated), including the core reaction zone/shell (9);

at least three fluid flows, each in a different coaxial zone/reformate (131) flows within reformate confining wall (85) & water (121) flows through boiler reservoir (123) outer wall (71) & hot fluid (127) flows outside inner reservoir wall (47);

wherein at least two of the fluid flows comprise a reactant (water (121) & reformat (131)) that is pre-heated from an initial temperature to a second temperature suitable for a reaction by traversing a coaxial zone (illustrated), and wherein at least one of the fluid flows/hot fluid (127) comprises a hot product of a reaction that is cooled from an initial elevated temperature to a second cooler temperature by traversing a coaxial zone (illustrated).

9. Claims 1, and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Clawson (WO 98/08771).

With respect to claims 1, Clawson teaches a reactor/reformer (fig. 1, 10) comprising: a core reaction zone (fig. 1, 28&24), the core reaction zone (28 & 24) being configured to conduct exothermic reaction including partial oxidation; shells/vessels (12, 58, 18) each having a shell wall (illustrated), the shells/vessels (12, 58, 18) being arranged coaxially about the core reaction zone (28 & 24) (illustrated); a gap (illustrated) being defined between each of the shells' walls to form a plurality of coaxial zones (illustrated), the reactor/reformer (1) being configured to permit heat transfer directly from one zone to another (illustrated); and the reactor/reformer (10) being configured so that hydrocarbon feed stock/fuel inlet(46) is preheated by traversing a first zone/bottom of helical tube (32), and an oxygen containing gas is preheated by traversing a second zone/top of helical tube (32).

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With respect to claims 17-18, Clawson teaches spacers/screens/perforated plates (68) and (30) placed in the zones/reformer vessel (12) and first vessel (30) (illustrated) to maintain spacing between successive shells.

Conclusion

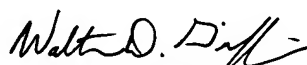
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KH

1/31/2006


Walter D. Griffin
Primary Examiner